

Please bring two copies of this manifest with you on your mission day.

Crew Manifest

Mission Date _____

Teacher's Name and School _____

Number of Students _____ Number of Teachers _____

Fill the "starred (*)" positions first, then the remainder of the positions.

TEAMS	MARS CONTROL CREW	SPACE CRAFT CREW
COM (Communications) 4 Members (Min. 2)	* _____ _____	* _____ _____
Data 4 Members (Min. 2)	* _____ _____	* _____ _____
NAV (Navigation) 2-4 Members (Min. 2)	* _____ * _____	* _____ * _____
Probe 2-4 Members (Min. 2)	* _____ * _____	* _____ * _____
REM (Remote) 2-4 Members (Min. 2)	* _____ * _____	* _____ * _____
ISO (Isolation) 2-6 Members (Min. 2)	* _____ * _____ _____	* _____ * _____ _____
LS (Life Support) 2-6 Members (Min. 2)	* _____ * _____ _____	* _____ * _____ _____
MED (Medical) 2-4 Members (Min. 2)	* _____ * _____	* _____ * _____

*This manifest has slots for up to 36 crew members. If you have a few more students than this, then please call the Challenger Center and we can give you some ideas for additional team roles. Please also call if you would like to discuss any special needs.

How Do I Do My Job?

COMMUNICATIONS TEAM

If you are selected to be a mission specialist on the Communications (COM) Team, you will be the verbal link between Mars Control and the Mars Transport Vehicle (MTV). Your assignment will involve reading, speaking, and listening.

Practice Message

Note: On real NASA missions, Mars Control speaks to the MTV by first calling the name of the MTV (Atlantis, Endeavour, Discovery), then following with their location (Houston, Kennedy Space Center) and request. (Remember: You will be part of Mars Control during your mission)

Example

Mars Control

"MTV, this is Mars Control. I have a message for the medical team. Over."

Mars Transport Vehicle

"Mars Control, this is MTV. We are ready to receive. Over."

Mars Control

"MTV, this is Mars Control. The message for the medical team is, 'We are ready to begin our tests.' Over."

Mars Transport Vehicle

"Mars Control, this is MTV. We acknowledge. Over."

What will I do?

MTV

- Send messages to Mars Control
- Receive messages from Mars Control
- Operate the moveable cameras

Mars Control

- Send messages to the MTV
- Receive messages from the MTV
- You will be the only verbal link between Mars Control and the MTV!

Communication Reminders

- When the message is complete, say "Over."
- Read the message before sending. Check to make sure it makes sense.
- Alert the team receiving the message before you say, "We are ready to receive."
- Speak in a normal voice when using the microphone.
- Do not send any message that is not written down or does not have a team name.
- Only send messages that are mission related.

DATA TEAM

How Do I Do My Job?

If you are selected to be a mission specialist on the data (DATA) team, your mission will be to send messages, images, and data between the MTV and Mars Control. Your responsibilities will include sending data, instructions, and images, and making sure each team receives and collects its data. Your assignment will involve reading and using the computer.

Vocabulary I need to know

Data- numerical information collected by the space crew team doing experiments.

Image- a computerized picture of equipment or materials used by a team in the MTV.

What will I do?

MTV

- Send messages to Mars Control
- Receive video images
- Deliver messages to teams

Mars Control

- Receive messages from the MTV
- Send video images
- Deliver messages to teams

On the job

- Read all messages before sending. Check to see that they all make sense.
- Deliver messages quickly. This information is vital!
- Do not send any message that is not written down or that does not include a team name.
- Only send messages that are related to the mission.
- You may ask any team to rewrite the message for you if you can't read the handwriting.

NAVIGATION TEAM

How Do I Do My Job?

If you are selected to be a mission specialist on the navigation (NAV) team, your mission will be to use a computer to run navigational simulations, to find latitudes and longitudes on Mars, and to establish the correct Mars orbit. It will be your responsibility to land the MTV on the surface of Mars and to move the craft in space. Your assignment will involve math, reading, calculating, and listening to point-to-point instructions using a headset.

Vocabulary I need to know

Astrotelescope- a device that uses a laser to measure the distance to objects by timing how long it takes a beam of light to travel to an object and return

Constellation- a formation of stars perceived as a figure or design

Trajectory- the path a falling object follows

Triangulation- calculation of position of the MTV from three known objects

1.6 km = 1 mile

What will I do?

MTV

- Establish Mars orbit
- Determine where to land
- Land and launch Spacecraft
- Communicate directly with teammates using headsets

Mars Control

- Collect, record, and analyze data
- Use *MarsNet* for research
- Send images to the MTV
- Communicate directly with teammates using headsets

On the job

- Be sure to record all data on your Data Log.
- Do not delay when sending data to your partners.

PROBE TEAM

How Do I Do My Job?

If you are selected to be a mission specialist on the probe (PROBE) team, your mission will be to build a probe that will be launched to one of the two moons of Mars. Your assignment will involve reading, speaking, and listening to point-to-point communications on headsets.

Vocabulary I need to know

Airlock- a sealed chamber where the probe is kept

ALF camera- Alternate Line Focus camera; allows Mars Control closer view of the parts of the probe

Component- an electronic part that is plugged into the motherboard

Deploy- to release

Motherboard- the base of the probe

Power Supply- supplies power to probe

Probe- a data-collecting device which explores the natural satellites of Mars

Test Cable- a wire that carries electricity from one component to another

Video Processor- transmits images from probe

What will I do?

MTV

- Assemble a probe
- Deploy the probe
- Use point-to-point headset

Mars Control

- Direct probe assembly
- Collect, analyze, and record data
- Use point-to-point headset
- Use *MarsNet* to research

On the job

- Unless an authorized person is entering or exiting the probe room, the clean room doors must be kept closed.
- Be sure to listen carefully to instructions you receive over the headset.

REMOTE TEAM

How Do I Do My Job?

If you are selected to be a mission specialist on the remote (REM) team, your mission will be to compare Mars soil and rocks with Earth soil and rocks. You are responsible for locating similar minerals, suitable for use in the greenhouses. Your assignment will involve reading, using equipment, using the glovebox, and sending messages.

Vocabulary I need to know

Balance- an instrument used to measure mass

Basalt- a dark-colored, extrusive igneous rock. Commonly found on earth covering vast areas around shield volcanoes

Extrusive Rocks- igneous rocks that cooled and solidified on the earth's surface

Glovebox- a self-contained mini-lab; used to protect delicate experiments

Igneous Rocks- rocks made from melted materials

Mass- the amount of matter in an object

Metamorphic Rocks- formed as a result of change due to heat, pressure, or chemical activity

Sedimentary Rocks- rocks formed from cemented particles or precipitation

Volume- the space an object takes up

What will I do?

MTV

- Perform soil tests
- Classify rocks
- Measure mass and volume

Mars Control

- Collect, record, and analyze data
- Use *MarsNet* for research
- Select suitable soils

On the job

- Send information to your partner as soon as you retrieve it.
- Record and analyze data carefully.

ISOLATION TEAM

How Do I Do My Job?

If you are selected to be a mission specialist on the isolation (ISO) team, your mission will be to work with and monitor hazardous chemicals, radioactive materials and micro-meteoroid impact panels in the MTV and Mars Control. Your assignment will involve reading, writing, and using robots.

Vocabulary I need to know

Balance- and instrument used to determine mass

CPM (counts per minute) - the number of radioactive particles striking the sensor of a Geiger counter during each minute

Filter- a device used to remove impurities from the air

Geiger counter- a device used to measure radioactivity

Isolation chamber- an airtight, enclosed work area

Micro-meteoroid- tiny particles of dust in space; can damage a MTV

Radioactivity- a natural property of some materials that causes the materials to emit sub-atomic particles that can be measured with a Geiger counter. High levels of radioactivity are hazardous to living things.

What will I do?

MTV

- Test for leaking chemicals
- Test for micrometeoroid impacts
- Test for radioactivity
- Send and receive messages

Mars Control

- Collect, record, and analyze data
- Use *MarsNet* for research
- Monitor hazardous materials
- Send and Receive messages

On the job

- Perform many crucial experiments using the robotic arm.
- Spend time practicing basic robot operation **before** beginning material retrieval.
- Ask Mars Control for help with the robotic arm if necessary.

LIFE SUPPORT TEAM

How Do I Do My Job?

If you are selected to be a mission specialist on the life support (LS) team, your mission will be to monitor and maintain all life support systems aboard the MTV, including air temperature, pressure, and quality along with water quality and power systems. Your assignment will involve reading, conducting experiments, and writing messages.

Vocabulary I need to know

Barometer- an instrument for measuring air pressure

Beaker- an open-mouthed, thin glass vessel, having a projecting lip for pouring

Environmental Condition- includes the temperature, air pressure and humidity

Graduated Cylinder- a tall narrow container with a volume scale used especially for measuring liquids

Humidity- the amount of moisture in the air

Hygrometer- an instrument used to measure relative humidity

Indicator- a chemical used for testing the pH of a liquid

Liter- a metric unit of measure; used to measure volume

ML (milliliter) - one thousandth of a liter (a unit of volume)

pH- a number that tells how acidic or basic a liquid is

ppm- parts per million

TDS- Total Dissolved Solids; how much material is dissolved in water

Valve- a device used to control the flow of air or water

What will I do?

MTV

- Analyze and test life support systems
- Test water pH
- Maintain a safe working environment
- Send and receive messages

Mars Control

- Collect, record, and analyze data
- Monitor life support systems
- Send and receive messages
- Use *MarsNet* for research

On the job

- Analyze environment by using a hygrometer, barometer and thermometer.
- Examine greenhouse plants to determine which ones would grow best in space.
- Test pH levels of water to ensure a safe drinking water supply.

MEDICAL TEAM

How Do I Do My Job?

If you are selected to be a mission specialist on the Medical (MED) Team, your mission will be to perform non-invasive medical tests on the MTV crew and report the results to Mars Control. Your assignment will involve reading, observation, experimenting and communicating.

Vocabulary I need to know

Auditory reaction time- the length of time it takes to react to sound

Blood pressure- the force of the blood on the walls of the blood vessels

Pulse rate- the number of heartbeats per minute

Respiration rate- the number of breaths per minute

Skin temperature- external body temperature

Visual reaction time- the length of time it takes to respond to an image

What will I do?

MTV

- Test for response time
- Measure respiration rate
- Measure skin temperature
- Measure blood pressure and heart rate

Mars Control

- Collect, record, and analyze data
- Monitor crew health
- Send and receive messages
- Send images as needed
- Use *MarsNet* for research

On the Job

- Be sure to compare test results to information found during your research.
- If an astronaut's test results are outside a healthy range, have them re-tested.